IS 6796 (1997): Propyl Gallate, Food Grade [FAD 8: Food Additives]

BLANK PAGE

भारतीय मानक

प्रोपाईल गैलेट, खाद्य ग्रेड — विशिष्टि

(पहला पुनरीक्षण)

Indian Standard

PROPYL GALLATE, FOOD GRADE — SPECIFICATION

(First Revision)

ICS 67.220.20; 71.080.70

BUREAU OF INDIAN STANDARDS
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002

November 1997 Price Group 1

AMENDMENT NO. 1 FEBRUARY 2006
TO
IS 6796 : 1997 PROPYL GALLATE, FOOD GRADE — SPECIFICATION

(First Revision)

(*Page* 1, *Table* 1) — Delete Sl No. (vii) and renumber the subsequent serial numbers.

[*Page* 2, *Table* 1, *Sl No.* (viii), *col* 3] — Substitute '10' *for* '30'.

(FAD 8)

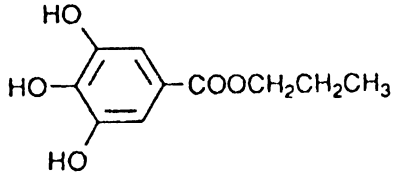
Reprography Unit, BIS, New Delhi, India

FOREWORD

This Indian Standard (First Revision) was adopted by the Bureau of Indian Standards, after the draft finalized by the Food Additives Sectional Committee had been approved by the Food and Agriculture Division Council.

With the increased production of processed foods, manufacturers have started adding a large number of substances, generally in small quantities, to improve the appearance, flavour, texture or storage properties, etc, of the processed foods. As certain impurities in these substances have been found to be harmful, it is necessary to have a strict quality control of these food additives. A series of standards was, therefore, prepared to cover purity and identification of these substances. These standards would help in checking purity, which requires to be checked at the stage of manufacture, for it is extremely difficult to detect the impurity once these substances have been added to the processed foods. Besides, these standards are intended to guide the indigenous manufacturers in making their product conform to specifications that are accepted by scientists, health authorities and international bodies.

Use of propyl gallate, food grade is permitted under the *Prevention of Food Adulteration Rules*, 1955 as an anti-oxidant in edible oils and fats except *GHEE* and butter. Its chemical names are propyl gallate and *n*-propyl ester of 3, 4, 5- trihydroxybenzoic acid. Its empirical formula is $C_{10}H_{12}O_5$. Its molecular weight is 212.21. Structural formula of propyl gallate is:



This standard was first published in 1972. The standard is being revised to make the following additions/changes:

a) To provide a separate clause for description including the solubility property to keep it in line with food chemical codex NRC.

b) To upgrade the standard by providing limits for heavy metals, chlorinated organic compounds, free acid and absorption.

c) To provide for marking instructions for storage and expiry/best before date.

d) To update referred standards.

In the preparation of this standard, considerable assistance has been derived from the following:

Compendium of Food Additive Specifications, Volume 2, Joint FAO/WHO Expert Committee on Food Additives (JECFA), 1992.

Food Chemical Codex. Third Edition. National Academy of Sciences, National Research Council, Washington DC, USA.

This standard is in line with both the FAO/WHO and FCC standard.

For the purpose of deciding whether a particular requirement of this standard is complied with the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS 2 : 1960 'Rules for rounding off numerical values' (*revised*)'. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

Indian Standard

PROPYL GALLATE, FOOD GRADE — SPECIFICATION

(First Revision)

1 SCOPE

This standard prescribes the requirements and methods of sampling and test for propyl gallate, food grade.

2 REFERENCES

The following standards contain provisions which through reference in this text, constitute provision of this standard. At the time of publication, the editions indicated were valid. All standards are subject to revision and parties to agreements based on this standard are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below:

IS No.	*Title*
1070 : 1992	Reagent grade water (*third revision*)
1699 : 1995	Methods of sampling and test for synthetic food colours (*second revision*)
2362 : 1993	Method for determination of water by the Karl Fischer Method (*second revision*)
6798 : 1997	Octyl gallate, food grade

3 DESCRIPTION

Propyl gallate is a white to creamy-white crystalline, odourless solid with a slightly bitter taste. The material is slightly soluble in water, ethanol and ether and freely soluble in propylene glycol and fat.

NOTE — The solubility is intended only as information regarding approximate solubility and is not to be considered as a quality requirement and is of minor significance as a means of identification or determination of purity, and dependence must be placed on other specifications.

4 REQUIREMENTS

4.1 Identification Tests

4.1.1 Melting range shall be 146 to 150°C after drying at 110°C for 4 hours.

4.1.2 Dissolve about 0.5 g of propyl gallate in 10 ml of N sodium hydroxide solution and boil for 30 min. Cool the mixture and carefully acidify with 2 N sulphuric acid. Filter off the precipitate, wash with a minimum amount of water and then dry at 110°C for 2 hours. The melting point of the resulting gallic acid shall be about 240°C, with decomposition.

4.1.3 Add 1 ml of ammonium hydroxide to 5 ml of one percent ethanolic solution of propyl gallate. A pink to red colour shall appear.

4.2 The material shall also conform to the requirements given in Table 1.

Table 1 Requirements for Propyl Gallate, Food Grade

Sl No.	Characteristic	Requirement	Method of Test, Ref to	
			Annex of This Standard	Other Standard
(1)	(2)	(3)	(4)	(5)
i)	Purity as $C_{10}H_{12}O_5$, percent by mass, *Min*	99	A-1	—
ii)	Moisture, percent by mass, *Max*	0.5	A-2	—
iii)	Sulphated ash, percent by mass, *Max*	0.05	—	A-3 of IS 6798
iv)	Chlorinated organic compounds (as chlorine), mg/kg, *Max*	100	—	A-4 of IS 6798
v)	Free acid, (as gallic acid), percent by mass, *Max*	0.5	—	A-5 of IS 6798
vi)	Arsenic (as As), mg/kg, *Max*	3	—	15 of IS 1699
vii)	Lead (as Pb), mg/kg, *Max*	10	—	15 of IS 1699
viii)	Heavy metals (as Pb) mg/kg, *Max*	30	—	16* of IS 1699

* The quantum of sample to be taken for test shall be 1 g.

5 PACKING, STORAGE AND MARKING

5.1 Packing

The material shall be securely packed in well-filled containers with minimum access to light and air. The containers shall be such as to preclude contamination of the contents with metals or other impurities.

5.2 Storage

The material shall be stored in a cool and dry place so as to avoid exposure to heat.

5.3 Marking

Each container shall be legibly and indelibly marked with the following information:

a) Name of the material including the words 'Food Grade';
b) Name and address of the manufacturer;
c) Net content when packed;
d) Batch or code number;
e) Instructions for storage;
f) Expiry/Best before date; and
g) Any other requirements as specified under the *Standards of Weights and Measures (Packaged Commodities) Rules*, 1977 and *Prevention of Food Adulteration Rules*, 1955.

5.3.1 *BIS Certification Marking*

The containers may also be marked with the Standard Mark.

5.3.1.1 The use of the Standard Mark is governed by the provisions of the *Bureau of Indian Standards Act*, 1986 and the Rules and Regulations made thereunder. The details of conditions under which the licence for the use of Standard Mark may be granted to manufacturers or producers may be obtained from the Bureau of Indian Standards.

6 SAMPLING

Representative samples of the material shall be drawn according to the method prescribed in 4 of IS 1699.

7 QUALITY OF REAGENTS

Unless specified otherwise, pure chemicals and distilled water (*see* IS 1070) shall be employed in tests.

NOTE — 'Pure chemicals' shall mean chemicals that do not contain impurities which affect the results of analysis.

ANNEX A

[Table 1, Sl No. (i) and (ii)]

ANALYSIS OF PROPYL GALLATE

A-1 PURITY

Two methods, that is, spectrophotometric and bismuth nitrate, have been specified. Either could be used depending upon the facilities available.

A-1.1 Spectrophotometric Method

A-1.1.1 Dry a suitable quantity of sample in an oven at 110°C for 4 h. Cool it in a desiccator. Prepare a solution of a dried sample in 80 percent ethanol containing 5μ g/ml and determine the extinction at 218 and 275.5 nm.

$$\sum {}^{1\%}_{1\ cm}{}^{(218\ nm)\ 1240-1255} ; \sum {}^{1\%}_{1\ cm}{}^{(275.5\ nm)\ 497}$$

A-1.1.2 *Calculation*

Propyl gallate, percent by mass =

$$\frac{\sum {}^{1\%}_{1cm} \text{ of sample}}{\sum {}^{1\%}_{1cm} \text{ of a pure standard reference}} \times 100$$

A-1.2 Bismuth Nitrate Precipitation

A-1.2.1 *Reagents*

A-1.2.1.1 *Bismuth nitrate*

Dissolve 5 g of bismuth nitrate in 10 ml of distilled water and 7.5 ml of nitric acid. Dilute the solution to 250 ml.

A-1.2.1.2 *Dilute nitric acid* — 1 in 300.

A-1.2.2 *Procedure*

Dry a suitable quantity of sample in an oven at 110°C for 4 h. Cool it in a desiccator. Weigh 200 mg of a sample of propyl gallate into a 400 ml beaker. Add 150 ml of water and heat to boiling. Then with constant and vigorous stirring add 50 ml of bismuth nitrate. Continue stirring for a few minutes more until precipitation is complete, then allow the solution to cool to room temperature. Filter the yellow precipitate on a sintered glass crucible, wash it first with cold nitric acid and then with ice cold water, until free from acid. Dry the crucible with its contents at 110°C to constant mass.

A-1.2.3 *Calculation*

Propyl gallate, percent by mass =

$$\frac{\text{Mass of precipitate} \times 0.486\,3}{\text{Mass of the sample}} \times 100$$

A-2 MOISTURE

Oven-drying and Karl Fischer methods as specified in A-2 of IS 2362 shall be followed. However, for oven-drying method, drying shall be at 110 ± 1°C for 4 h in place of 90 ± 1°C for 6 h. In case of dispute, Karl Fischer method shall be used.

Bureau of Indian Standards

BIS is a statutory institution established under the *Bureau of Indian Standards Act,* 1986 to promote harmonious development of the activities of standardization, marking and quality certification of goods and attending to connected matters in the country.

Review of Indian Standards

Amendments are issued to standards as the need arises on the basis of comments. Standards are also reviewed periodically; a standard along with amendments is reaffirmed when such review indicates that no changes are needed; if the review indicates that changes are needed, it is taken up for revision. Users of Indian Standards should ascertain that they are in possession of the latest amendments or edition by referring to the latest issue of 'BIS Handbook' and 'Standards: Monthly Additions'.

This Indian Standard has been developed from Doc : No. FAD 8 (719).

Amendments Issued Since Publication

Amend No.	Date of Issue	Text Affected

BUREAU OF INDIAN STANDARDS

Headquarters:

Manak Bhavan, 9 Bahadur Shah Zafar Marg, New Delhi 110002
Telephones : 323 01 31, 323 33 75, 323 94 02

Telegrams : Manaksanstha
(Common to all offices)

Regional Offices :		Telephone
Central	: Manak Bhavan, 9 Bahadur Shah Zafar Marg NEW DELHI 110002	323 76 17 323 38 41
Eastern	: 1/14 C. I.T. Scheme VII M, V. I. P. Road, Maniktola CALCUTTA 700054	337 84 99, 337 85 61 337 86 26, 337 91 20
Northern	: SCO 335-336, Sector 34-A, CHANDIGARH 160022	60 38 43 60 20 25
Southern	: C. I. T. Campus, IV Cross Road, CHENNAI 600113	235 02 16, 235 04 42 235 15 19, 235 23 15
Western	: Manakalaya, E9 MIDC, Marol, Andheri (East) MUMBAI 400093	832 92 95, 832 78 58 832 78 91, 832 78 92

Branches : AHMADABAD. BANGALORE. BHOPAL. BHUBANESHWAR. COIMBATORE. FARIDABAD. GHAZIABAD. GUWAHATI. HYDERABAD. JAIPUR. KANPUR LUCKNOW. NAGPUR. PATNA. PUNE. THIRUVANANTHAPURAM.

Printed at Printograph, New Delhi, Ph : 5726847